

Farm to Elementary School Programming Increases Access to Fruits and Vegetables and Increases Their Consumption Among Those With Low Intake

Andrea B. Bontrager Yoder, PhD, MM¹; Janice L. Liebhart, MS²; Daniel J. McCarty, PhD³; Amy Meinen, MPH, RD⁴; Dale Schoeller, PhD¹; Camilla Vargas, MS⁵; Tara LaRowe, PhD, RD⁶

ABSTRACT

Objective: To assess the effectiveness of Wisconsin Farm to School (F2S) programs in increasing students' fruit and vegetable (FV) intake.

Design: Quasi-experimental baseline and follow-up assessments: knowledge and attitudes survey, food frequency questionnaire (FFQ), and lunch tray photo observation.

Setting: Wisconsin elementary schools: 1 urban and 8 rural.

Participants: Children, grades 3–5 (n = 1,117; 53% male, 19% non-Caucasian).

Intervention(s): Farm to School programming ranging from Harvest of the Month alone to comprehensive, including school garden, locally sourced produce in school meals, and classroom lessons.

Main Outcome Measures: Knowledge, attitudes, exposure, liking, willingness; FFQ-derived (total), and photo-derived school lunch FV intake.

Analysis: *t* tests and mixed modeling to assess baseline differences and academic-year change.

Results: Higher willingness to try FV (+1%; $P < .001$) and knowledge of nutrition/agriculture (+1%; $P < .001$) (n = 888), and lunch FV availability (+6% to 17%; $P \leq .001$) (n = 4,451 trays), both with increasing prior F2S program exposure and across the year. There was no effect on overall dietary patterns (FFQ; n = 305) but FV consumption increased among those with the lowest intakes (FFQ, baseline very low fruit intake, +135%, $P < .001$; photos: percentage of trays with no FV consumption for continuing programs decreased 3% to 10%, $P \leq .05$).

Conclusions and Implications: Farm to School programming improved mediators of FV consumption and decreased the proportion of children with unfavorable FV behaviors at school lunch. Longer-term data are needed to further assess F2S programs.

Key Words: educational activities, diet, child, school, overweight, farm (*J Nutr Educ Behav.* 2014;46:341-349.)

Accepted April 27, 2014. Published online June 18, 2014.

INTRODUCTION

Childhood obesity is a public health problem in the US.¹ Overweight and obesity track into adulthood and increase the risk of early-onset weight-related chronic diseases.^{2,3} Obesity's

causes are multifactorial, many of which begin early in life.^{4,5} Because of the magnitude of the problem, current research efforts focus on primary prevention. The Centers for Disease Control and Prevention identified environmental and policy

strategies for obesity prevention.⁶ Increasing fruit and vegetable (FV) consumption is 1 of these strategies despite mixed evidence for FV intake to decrease excess weight. One study found lower but nonsignificant body mass index gains in children who increased fruit consumption but found the opposite trend for those who increased only vegetable consumption.⁷ A recent review reported associations in experimental studies between increased FV consumption and reduced adiposity for overweight/obese adults, but not in children; however, half of longitudinal studies in children showed a significant inverse association between FV consumption and weight gain.⁸

Strategy choices require examining opportunities to reach individuals in various settings. Children spend significant time in school, which makes

¹Department of Nutritional Sciences, University of Wisconsin–Madison, Madison, WI

²Wisconsin Department of Health Services, Nutrition, Physical Activity, and Obesity Prevention Program, Madison, WI

³School of Health Care Professions, University of Wisconsin–Stevens Point, Stevens Point, WI

⁴Wisconsin Obesity Prevention Network, School of Medicine and Public Health, Institute for Clinical and Translational Research, University of Wisconsin–Madison, Madison, WI

⁵Wisconsin Department of Agriculture, Trade, and Consumer Protection, Madison, WI

⁶Department of Family Medicine, University of Wisconsin–Madison, Madison, WI

Address for correspondence: Andrea B. Bontrager Yoder, PhD, MM, Department of Nutritional Sciences, University of Wisconsin–Madison, 1415 Linden Drive, Madison, WI 53706; Phone: (608) 234-2870; Fax: (608) 262-5860; E-mail: ayoder@wisc.edu

©2014 SOCIETY FOR NUTRITION EDUCATION AND BEHAVIOR

<http://dx.doi.org/10.1016/j.jneb.2014.04.297>

it a prime setting for affecting a wide range of individuals through interventions and policy.^{9,10} Echoing the Institute of Medicine's belief that schools have an important role in teaching healthy behaviors, the Centers for Disease Control and Prevention identified increased FV consumption in school meals as a key strategy for obesity prevention, highlighting Farm to School (F2S) programs as a specific approach.^{6,11}

Farm to School, a national program with grassroots foundations, is proposed to positively influence children's dietary choices and consumption. Farm to School combines nutrition and agriculture education activities to increase FV access in schools, and ultimately aims to improve eating behavior.¹²⁻¹⁴ Farm to School programs are not theory-grounded by design,^{14,15} although their curricular programming has evolved to align with logical approaches to nutrition education: increasing knowledge, subsequently improving attitudes, and finally improving dietary behaviors. Nutrition knowledge and attitudes predict adolescent and adult dietary behaviors.^{16,17} Experiential knowledge gained in school gardens or farm visits may improve children's attitudes and preferences for specific FV.^{18,19} Preference for individual FV, in turn, improves consumption.^{20,21} Farm to School program effects on dietary behavior may function by increasing children's knowledge and FV exposure through curricular nutrition/agricultural lessons and hands-on activities (eg, taste testing, cooking demonstrations, or school gardens).

In a successful effort to foster F2S programming in Wisconsin, a coalition formed among the Departments of Health Services, and of Agriculture, Trade, and Consumer Protection (AmeriCorps F2S); the University of Wisconsin system; and the Michael Fields Agricultural Institute. As part of this, an evaluation was designed and performed to assess F2S programs' effectiveness in improving students' knowledge, attitudes, and behaviors relative to FV consumption. A novel aspect of this evaluation was using photographs of school lunch trays to examine F2S program impacts on children's lunch consumption. This article presents student-related results of the Wisconsin F2S evaluation, with objectives of as-

sessing cross-sectional baseline outcomes according to schools' prior F2S years, as well as change (overall and within prior-exposure groups) across a single program year.

METHODS

Participants and Recruitment

Elementary schools hosting AmeriCorps F2S (through Wisconsin's Department of Agriculture, Trade, and Consumer Protection) deemed by the program supervisor to have sufficient logistical and administrative support to conduct this evaluation ($n = 11$) were invited to participate in the evaluation. Schools that opted in ($n = 9$; 82%) were geographically distributed throughout Wisconsin, including 1 urban-area and 8 rural-area districts. From this representative but nonrandom sample, all third-, fourth-, and fifth-graders were invited to participate. These grades were expected to have the literacy and computer skills needed to complete the survey tools. Based on the known number of students opting out of the entire evaluation ($n = 20$ within 2 schools) and the number of students for whom AmeriCorps members submitted an evaluation identification ($n = 1,183$), there was approximately a 94% participation rate. An additional 66 students did not opt out but did not complete the knowledge and attitudes survey (KA) or food frequency questionnaire (FFQ) measures (presumably owing to absence on survey administration days), yielding approximately a 95% participation rate.

Parents received a description of the planned evaluation offering an opt-out opportunity; without this, students participated by default. The University of Wisconsin–Madison Institutional Review Board (IRB) reviewed the design and determined it to be IRB exempt because they considered this project to be curriculum evaluation; therefore, it was not necessary to obtain active consent from participants. Of the 9 schools, 2 were new to F2S programming at the start of the evaluation (fall, 2010); 2 had 1 prior year and 5 had ≥ 2 prior years. Program implementation at each school varied; AmeriCorps members could select from a list of 14 activities, which were

monitored through monthly activity reports submitted by AmeriCorps members ([Supplementary Table 1](#)).

Study Design

Data were collected at the start and end of the 2010–2011 academic year. AmeriCorps members attended a 2-hour training in September, 2010 detailing evaluation tools and methods. Members received additional technical assistance throughout the evaluation period via phone and e-mail. AmeriCorps members coordinated and administered all measures with additional volunteers as needed, and submitted data to the coordinating center at the University of Wisconsin. AmeriCorps members compiled de-identified data at each school and submitted to the coordinating center with evaluation identification numbers, sex, age, and ethnicity (used to connect across student measures). The percentage of students eligible for free/reduced-price lunches (%FRPL), obtained from Wisconsin's Department of Public Instruction, served as proxy for socioeconomic status.²²

Measures and Instruments

Students participated in at least 1 of the following: KA, the Block Kids FFQ 2004 (NutritionQuest, Berkeley, CA); and a lunch tray photo observation (LTPO). The KA and FFQ were administered online (paper versions were available upon request) during class time with adult supervision. The LTPO involved digital photography during school lunch.

The 60-item KA survey was developed from a recently validated food neophobia scale adapted previously for use with FV,^{23,24} questions used to assess knowledge about F2S curricula used in Wisconsin, and a survey used to assess the US Department of Agriculture Fresh FV Program in Wisconsin,²⁵ combined selectively to yield a 15- to 20-minute survey. From it, 6 constructs were calculated: knowledge of food, nutrition, and agriculture (15 questions); attitudes toward trying FV (20 questions); perception/self-efficacy for eating healthfully (2 questions); and for 20 specific FV, exposure (tasted/not), liking (of those previously

Download English Version:

<https://daneshyari.com/en/article/361238>

Download Persian Version:

<https://daneshyari.com/article/361238>

[Daneshyari.com](https://daneshyari.com)